

A new species of *Vemakylindrus* (Crustacea: Cumacea: Diastylidae) from California

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Abstract.—A new species of *Vemakylindrus*, *V. hystricosa* n. sp. is described from the continental slope off the coast of California. The new species can be distinguished from all other *Vemakylindrus* by the combination of the carapace and pereonites covered with spines of varying lengths, the telson longer than the uropods, and the terminal three articles of pereopod 1 being subequal and each article much less than 0.5 the length of the basis.

Vemakylindrus is a relatively small genus in the cumacean family Diastylidae, with only 13 described species. The genus ranges in depth from 63–3718 m, but the majority of species are known from below 1000 m. Despite being a small genus, representatives of *Vemakylindrus* have been recorded from every ocean basin. *Vemakylindrus* is an unusual genus within the Diastylidae, with the pseudorostral lobes being at least the length of the carapace body, and very frequently much longer.

Methods

All specimens were mounted in a 70% glycerin and 30% (70%) Ethanol solution, and drawn with a camera lucida on a Wild compound microscope. All body lengths were measured from the tips of the pseudorostral lobes to the posterior margin of pereonite 6.

Diastylidae Bate 1856

Vemakylindrus Bacescu 1961

Vemakylindrus hystricosa, new species

Figs. 1–3

Holotype material.—1 sub-adult male (LACM 61-94, 27°38'00"N, 115°16'16"W, 838 m).

Paratype material.—1 ovigerous female (USNM 310351, 37°13.54'N, 123°

16.26'W, 1820 m, 9-17-91), 1 sub-adult female (LACM 60-78, 27°54'25"N, 115°40'00"W, 1713–1740 m), 1 manca 1 (USNM 310352 37°23.51'N, 123°21.62'W, 1880 m, 9-15-91), 1 manca 1 (USNM 310353, 37°26.05'N, 123°19.24'W, 1760 m, 9-15-91).

Diagnosis.—Carapace, pereonites and pleonites covered with spines of varying length, with 1 pair large dorsal spines on each pereonite and similar but smaller paired spines dorsally on pleonites. Branchial regions of carapace swollen and rounded. Three terminal articles of pereopod 1 subequal in length, each much less than 0.5 basis length. Telson distinctly longer than uropod peduncles.

Description.—Ovigerous female, 7.7 mm. Carapace covered in long spines. Carapace, pereonites and pleonites covered with spines of varying length, with 1 pair large dorsal spines on each pereonite and similar but smaller paired spines dorsally on pleonites. Branchial regions of carapace swollen and rounded. Pseudorostral lobes as long as rest of carapace. Carapace ventral margin entirely lined with spines. Pereonites 1–5 with 1 large pair dorsal spines and multiple smaller spines. Pleonites 1–6 each bear at least 1 pair of medium spines dorsally (similar to Figs. 1A, 1 of holotype subadult male).

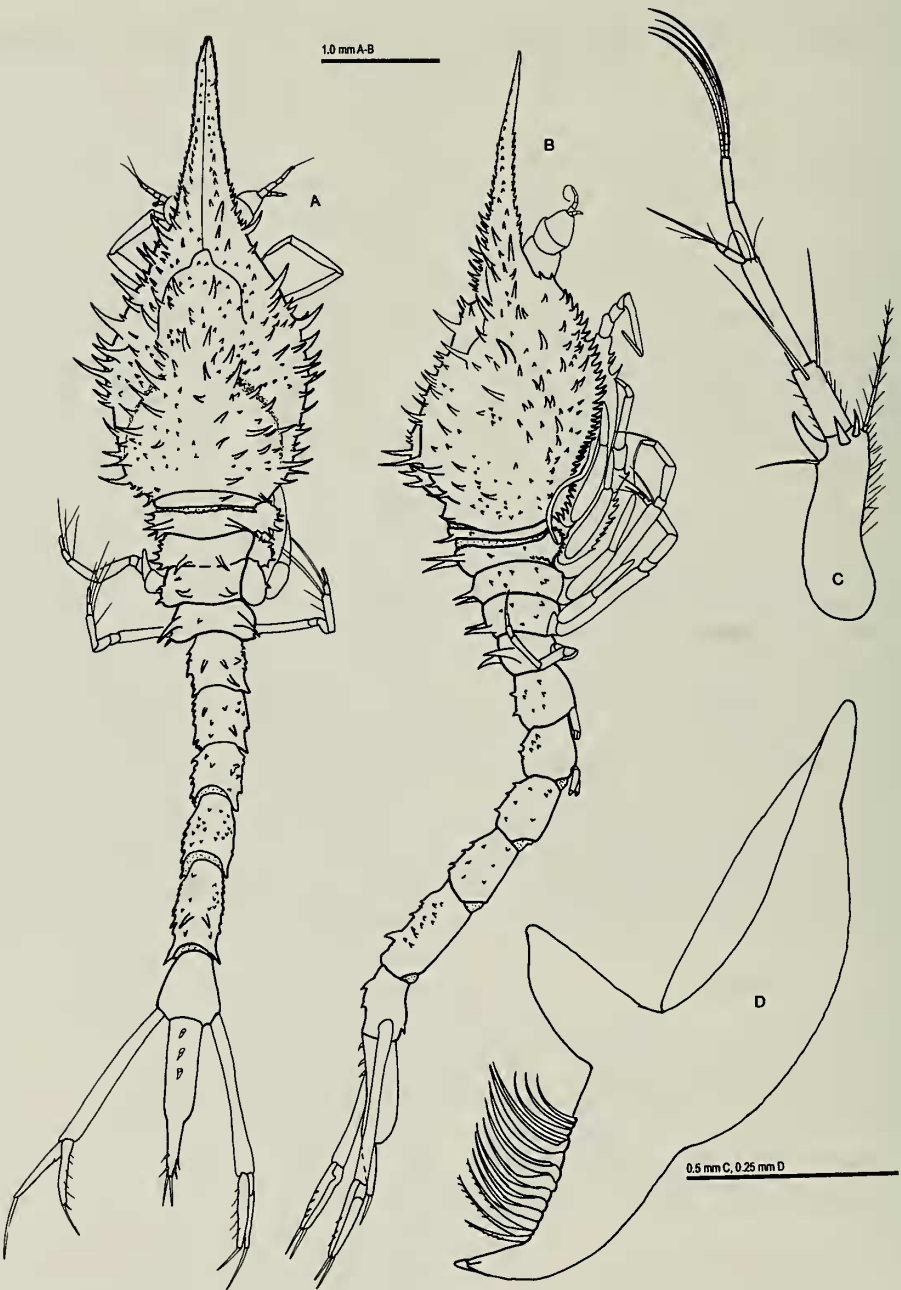


Fig. 1. *Vemakylindrus hystricosa*, new species. Holotype subadult male: A, full body, dorsal view; B, full body, side view. Paratype ovigerous female: C, antenna 1; D, mandible.

Antennule of three articles; article 1 and article 3 subequal in length, article 1 bearing 3 stout teeth distally, 1 plumose seta and 1 simple seta distally, margin lined with

fine setae; article 2 0.5 times as long as article 1, bearing 2 long simple setae distally, margins lined with fine setae; article 3 unarmed; main flagellum of 2 articles, termi-

nal article bearing 4 slender annulate setae; accessory flagellum of 2 articles, both articles together not as long as article 1 of main flagellum (Fig. 1C).

Antenna rudimentary, not figured.

Mandible navicular, with 13 lifting setae; lacinia mobilis slender on right mandible, distal 2 setae and lacinia bearing small setules; right incisor tri-cuspid (Fig. 1D)

Maxillule with two endites; outer endite with double row of stout simple setae distally, 1 slender simple seta on lateral margin, anterior face with many very fine simple setae; inner endite with 5 setae terminally, 2 stout tri-cuspid setae, 1 stout simple seta, 1 stout micro serrate seta, 1 slender simple seta, anterior face with many fine simple setae; palp with 2 long stout simple setae distally (Fig. 2A).

Maxilla with 3 endites; broad endite distal half of medial margin with double row of fine simple setae, 6 large stout pappose setae, 1 large plumose seta at distal corner, proximal half of medial margin with row of 37 simple setae, 2 stout pappose setae set below row, many groups of fine simple setae on anterior-medial face; inner narrow endite with 4 micro serrate setae terminally; outer narrow endite with 5 long micro serrate setae terminally (Fig. 2B).

Maxilliped 1 basis produced distally as blunt medial lobe, medial margin bearing 7 plumose setae, tip of lobe bearing 2 very short, very stout pappose setae, single long pappose seta originating between lobe and ischium; ischium present, reduced, unarmed; merus as long as carpus, bearing single pappose seta distally; carpus as long as merus, bearing 1 very long plumose seta distally, medial face bearing 8–10 pappose setae, medial margin bearing 3–4 hooked setae; propodus half as broad, not as long as carpus, bearing 2 very long plumose setae distally; dactylus half as broad as propodus, bearing few short pappose setae apically. (Fig. 2C).

Maxilliped 2 basis as long as all other articles together, distal margin bearing 3 plumose setae and 1 simple seta; ischium

present, compressed, unarmed; merus not as long as carpus, bearing a single plumose seta at each distal corner; carpus bearing 4 plumose setae on medial margin, 2 plumose setae on lateral distal corner; propodus as long as merus, bearing 4 simple setae on medial margin, single long plumose seta at mid-lateral margin, single plumose seta at lateral distal corner; dactylus half length and half width of propodus, bearing 1 stout and 1 slender simple setae apically; endite bearing 8 long stout simple setae (Fig. 2D).

Maxilliped 3 basis twice as long as all other articles together, medial margin bearing many short plumose setae, lateral distal corner bearing 4 stout plumose setae; ischium present, as long as carpus, medial margin bearing 3 short plumose setae; carpus medial distal corner bearing 1 short plumose seta, lateral distal corner bearing 2 plumose setae and single tooth; carpus as long as propodus, bearing 1 small simple seta and 1 tooth at medial distal corner, 1 plumose seta and 1 tooth at lateral distal corner; propodus bearing 1 simple and 1 plumose setae medially; dactylus as long as propodus, bearing 3 simple setae marginally, 2 simple setae apically; exopod slender, not as long as basis, basal article unarmed, flagellum bearing many long stout plumose setae (Fig. 2E).

Pereopod 1 basis as long as next 4 articles together, margins bearing slender plumose setae, distal corner bearing single stout plumose seta, quadrate in cross section with each corner bearing a row of stout teeth, proximal corner with stout tooth; ischium present, unarmed, not as long as merus; merus unarmed; carpus as long as propodus, bearing a few fine setae; propodus bearing a few fine setae, single small plumose seta on margin; dactylus as long as propodus, bearing 4 simple setae apically, several fine setae on margins; exopod not as long as basis, basal article with 8 stout teeth proximally, 1 plumose seta amongst teeth, single plumose seta distally, flagellum bearing many long stout plumose setae (Fig. 3A).

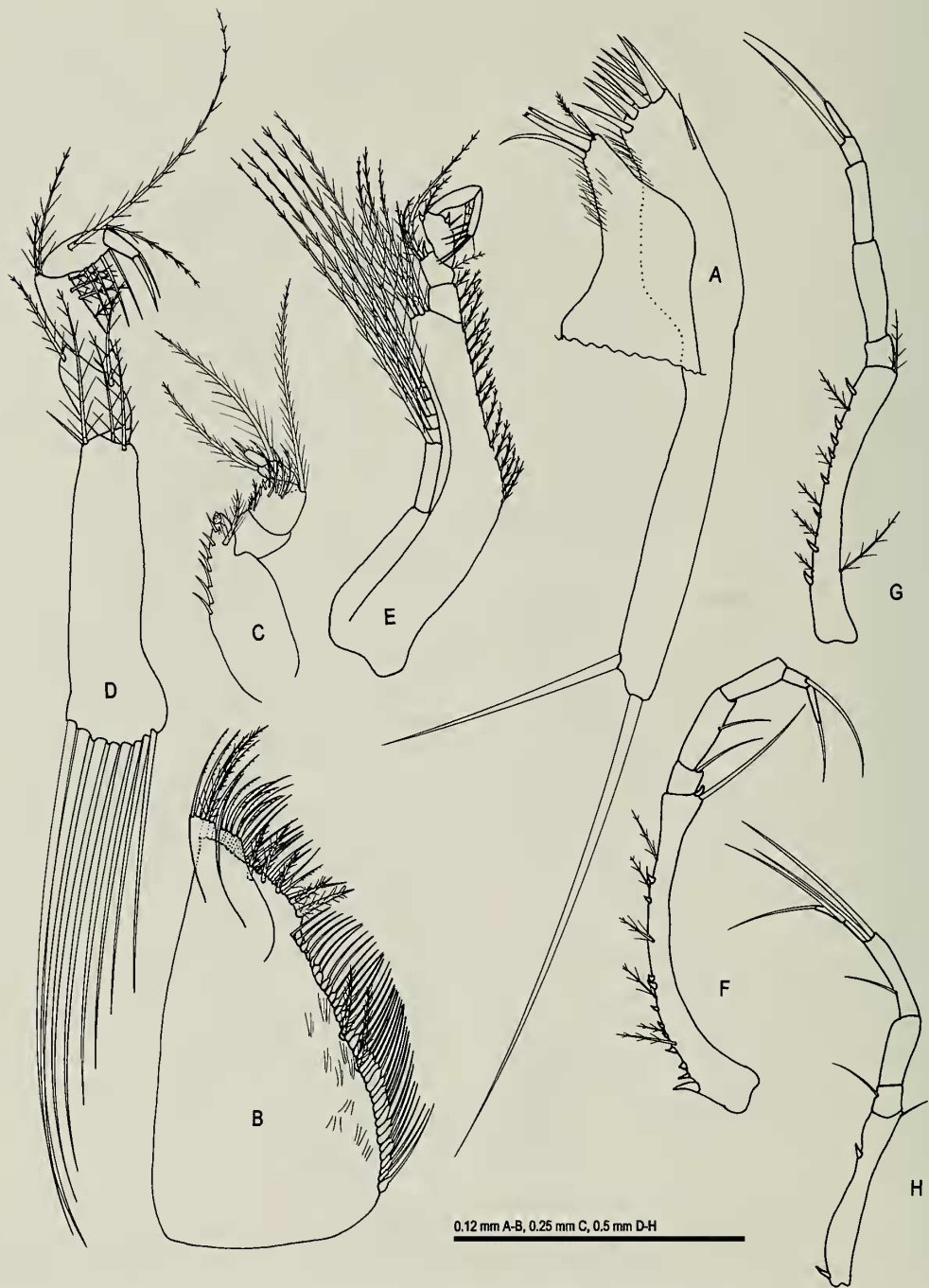


Fig. 2. *Vemakylindrus hystricosa*, new species. Paratype ovigerous female: A, maxilla 1; B, maxilla 2; C, maxilliped 1; D, maxilliped 2; E, maxilliped 3; F, pereopod 3; G, pereopod 4; H, pereopod 5.

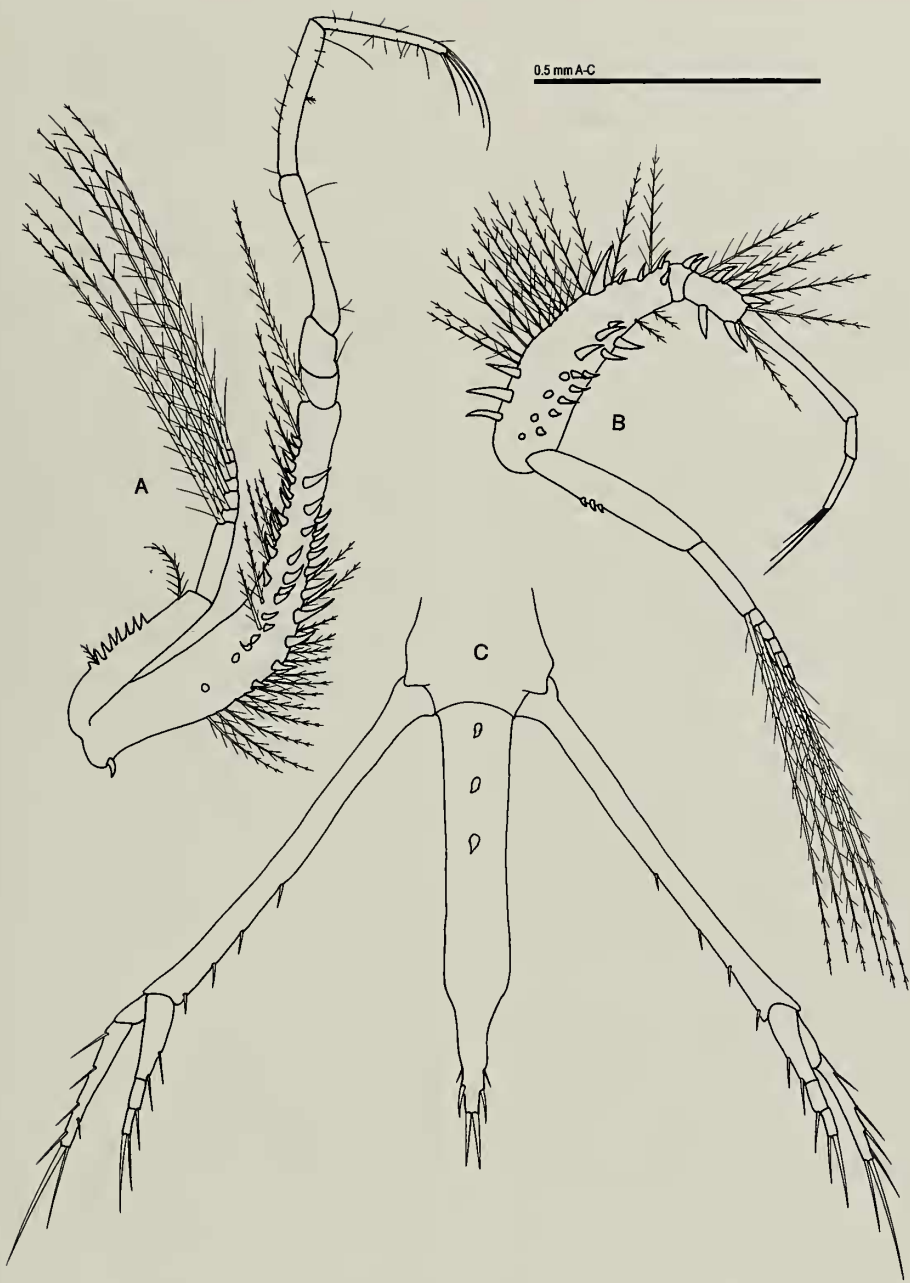


Fig. 3. *Vemakylindrus hystricosa*, new species. Paratype ovigerous female: A, pereopod 1; B, pereopod 2; C, telson and uropods.

Pereopod 2 basis as long as next three articles together, bearing many long plumose setae on lateral margin, 2 plumose setae on medial margin, with many large stout teeth; ischium present, compressed, unarmed except for 2 stout teeth; merus bear-

ing 5 long plumose setae and 2 stout teeth on lateral margin, single plumose seta and 2 stout teeth on medial margin; carpus 0.7 length of basis, unarmed; propodus as long as dactylus, unarmed; dactylus bearing 3 simple setae apically; exopod as long as ba-

sis, ischium, merus, carpus together, basal article with 3 stout teeth proximally, otherwise unarmed, flagellum bearing many long stout plumose setae (Fig. 3B).

Pereopod 3 basis longer than all other articles together, lateral margin bearing 5 plumose setae and many teeth, single large stout tooth proximally, medial distal corner bearing single long simple seta and single tooth; ischium present, bearing single simple seta at medial distal corner; merus longer than carpus, bearing single simple seta on medial margin; carpus unarmed; propodus 0.3 length carpus, bearing single long stout simple seta distally; dactylus longer than propodus, bearing single stout simple seta apically; exopod not present (Fig. 2F).

Pereopod 4 basis as long as next 4 articles together, bearing 5 plumose setae and several stout teeth on lateral margin, single plumose seta proximally on medial margin, single plumose seta at medial distal corner; ischium present, unarmed; merus longer than carpus, unarmed; carpus as long as propodus and dactylus together, unarmed; propodus 0.3 carpus length, bearing single stout simple seta distally; dactylus slender, longer than propodus, bearing single stout simple seta apically; exopod not present (Fig. 2G).

Pereopod 5 basis as long as next 3 articles together, bearing 1 small simple seta distally, 1 proximal and 1 distal tooth; ischium present, bearing single simple seta; merus unarmed, not as long as carpus; carpus as long as ischium and merus together, bearing single simple seta on margin, 2 long stout simple setae distally; propodus 0.3 length of carpus, bearing single stout seta distally; dactylus slender, bearing single simple seta apically (Fig. 2H).

Telson longer than uropod peduncles, pre-anal section much longer than post-anal section, bearing 2 pair lateral setae on post-anal section, 1 pair stout terminal setae, pre-anal section with three stout spines dorsally (Fig. 3C).

Uropod peduncles slender, bearing 4 short setae medially; endopod tri-articulate,

article 1 bearing 2 setae medially, article 2 bearing 1 seta medially, article 3 bearing 2 long setae apically; exopod bi-articulate, article 1 unarmed, article 2 bearing 4 slender setae laterally, 2 long setae apically (Fig. 3C).

Etymology.—The species is named *hystricosa* after the Latin *hystricosus*, meaning prickly, from the Greek *hystrix*, meaning porcupine.

Remarks.—Five other species of *Vemakylindrus* bear spines on the carapace and body; however, *V. hystricosa* can clearly be distinguished from the previously described spiny species. In *V. charcoti* (Reyss 1974), the pseudorostral lobes are directed sharply dorsally, and in *V. hystricosa* the pseudorostral lobes are horizontally directed. In *V. grandidentatus* Gamô 1988, the three terminal articles of pereopod 1 are subequal (as in *V. hystricosa*), but each article is approximately 0.5 the length of the basis, while in *V. hystricosa* each article is much less than 0.5 the basis length. In *V. oxycanthus* Gamô 1988 the telson is subequal to the uropod peduncles, and in *V. hystricosa* the telson is distinctly longer than the uropod peduncles. *Vemakylindrus prolatus* (Jones 1969) bears sparse and smaller spines on the carapace, seven large and four small dorsal spines on the telson, and a strong ventral spine on the first pleonite anterior to the pleopods, while in comparison the new species has many carapace spines, only three large dorsal spines on the telson, and no ventral spine on the first pleonite. *Vemakylindrus multiuncifer* Gamô 1998 is the most similar of the spiny species; however, in *V. hystricosa* the pseudorostral lobes are relatively shorter than in *V. multiuncifer*, the carapace does not have 12 very large spines, nor are the smaller spines hook shaped, there are no ventral spines on the posterior pereonites and anterior pleonites, and there are no stout carpal setae on pereopods three and four, while there are two stout carpal setae on pereopod 5. The differences between *V. multiuncifer* and *V.*

hystricosa are not due to stage, as the holotypes of both species are subadult males.

In the mancae of the new species, the pseudorostral lobes are proportionally much longer than in the adults or subadults.

The choice of the subadult male as the holotype, rather than the available adult female, is due to the relative condition of the two specimens. The subadult male is entire, the carapace has fewer of the spines broken off, and is not soft, while in comparison the adult female has many of the spines broken off, is very soft, and generally in much poorer condition.

Discussion.—The specimens described in this study were collected from two disparate places, both geographically and temporally, with some specimens collected in 1991 from off the California coast near Monterey and others (including the holotype) collected in 1978 from off the Pacific coast of Baja California. It may seem surprising to observe specimens of a small benthic crustacean, which is assumed to have low dispersal capabilities due to brooding of the young, in two such separate locations. It is very clear that the specimens all belong to the same species, with identical spine patterns and all other characters identical between the two locations. However, the coast of California from Point Conception down to Baja has been described as a distinct biogeographic province (San Diegan) by Briggs (1995), and the region between San Francisco and Point Conception is well known as a region in which the fauna of northern California and southern California overlap.

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